Proposed FY2002 & FY2003 Work Items

NSNFP Semi-Annual Strategy Meeting

David S. Rhodes
Manager, DOE SNF/Pu Special Projects
June 26/27, 2001

FY2002 Work Items

- **Disposal container criticality**
- **Total system performance assessment**
- **Design basis event and beyond design basis event analyses**
- **Management**
  - Waste form analyses reviews
  - Management activities

Disposal container criticality (cont.)

- **Deferred FY2001 Phase III criticality analyses**
  - Complete external consequence code development left after software stand-down ($65k) and code qualification ($20k) $85k
  - Complete external criticality analysis which was delayed by late Transport & Accumulation feeds (geochemistry work) $100k
  - Conduct external probability calculation following completion of methodology work in FY2001 (follows geochemistry work) $70k

- **Deferred funding should be available from FY2001 funds and not have to come out of FY2002 funding** Total=$255k

Disposal container criticality

- **FY2002 Phase I & II waste form/disposal container analyses**
  - Revise FFTF criticality calculation and waste form report $50k
    - Based on recent fuel form information (numbers of pins)
    - Doesn't include potential reanalysis if significantly different
  - Complete benchmark and critical limit analysis including MCNP runs following FY2001 investigation $100k

Total=$150k

Disposal container criticality (cont.)

- **FY2002 Phase III criticality analyses**
  - Conduct last 4 of 5 needed External Transport & Accumulation calculations (1st calc done last year with methodology) $120k
  - Probability of criticality before 10,000 years for co-disposal WPs igneous intrusion, seismic, weld flaw (8 fuels in 1 calc) $100k
  - Configuration generator model validation report (shared) $50k
  - Geochemistry model abstraction for DOE SNF co-disposal waste package calculations (shared) $50k
  - Criticality model validation reports for DOE SNF co-disposal and DOE range of conditions calculation (shared) $50k
  - Management activity for WP Supervisor (P/T) $150k
    - monthly reporting, quarterly meetings, coordination of work packages, annual planning, computer support such as licenses, travel, managerial review of products

Total=$520k

Total system performance assessment

- **FY2002 geochemical interactions calculations**
  - analyses of geochemical conditions in failed co-disposal waste packages
  - Adds 2 remaining representative fuels to 6 contained in REV 01
    - Training Reactor Isotopes General Atomic (TRIGA)
    - Shippingport PWR
  - Final calculation by September 2002 $70k
- **FY2002 TSPA-LA calculation for 11 fuel groups**
  - Run TSPA supplemental model for selected DOE SNF
  - TSPA-LA base case model expected by August 2002
  - Conduct portion of DOE SNF analyses from August to September 2002 (will continue in FY2003) $130k
  - Final calculation in FY2003 (December 2002)

Total=$200k

Design basis event and beyond design basis event analyses

- **FY2002 DBE & BDBE**
  - Develop canister strain argument for no-breach criteria $30k
    - Needs to be briefed to the NRC at a technical exchange
    - Revise to support LA strategy--white paper minimum
  - Reviews, planning, meetings, reports $20k
    - Review source terms inputs to DBE and BDBE calculations are appropriate for their intended use and are adequately referenced
  - Support preclosure ISA technical products such as Hazard analysis, DBE categorization analyses, and Classification analyses $20k

Total =$70k

Management

FY2002 Management

- Licensing strategy white paper for DOE SNF for OCRWM, YMSCO, DOE-EM, NSNFP, BSC agreements $40k
- Project management activities -- Project Manager (P/T) $150k
  - Includes reviewing NSNFP waste form input reports, GOTH, and ASTM standards such as drying standard (but not pyrophoricity of uranium metal fuels)
  - monthly reporting, quarterly meetings, coordination of work packages, annual planning, computer support such as licenses, travel, management review of products
- Subtotal=$190k

FY2002 Summary

◆ Deferred FY2001 Work	**$255k**
◆ FY2002 Phase I & II Work	$150k
◆ FY2002 Phase III work	$520k
◆ FY2002 TSPA	$200k
◆ FY202 DBE & BDBE	$ 70k
◆ FY2002 Management	$190k
– Subtotal	$1,130k
– Fee	$ 57k
– Total FY2002 Funded Work	**$1,187k**
–	

– Suggested additions for FY2002

◆ Suggest you add MCO	$200k
◆ External consequence AMR for DOE fuels	$120k

FY2003 Work Items

- **Disposal container criticality**
- **Total system performance assessment**
- **Design basis event and beyond design basis event analyses**
- **System studies**
  - Waste form analyses reviews
  - Management activities

Disposal container criticality

- **FY2003 Criticality**
  - Partial waste form / disposal container disposal analysis of 9th representative fuel --Three-Mile Island (TMI) after NSNFP white paper -- evaluation of HLW geochemistry interaction $100k
  - Update topical addendum (shared with RW) $40k
  - DOE SNF Final Report summarizing all calculations to demonstrate compliance with methodology in topical report, safety strategy, and acceptance criteria $250k
    - Defines the necessary criticality controls, validates grouping or provides regrouping, and evaluates impact analyses and design changes on calculations
  - Final Phase III summary report for all fuel groups $100k
  - External consequence AMR for DOE fuels (pull to 02?) $120k
  - Total=$610k

Total system performance assessment

- **FY2003 TSPA**
  - Final geochemical interactions calculation (REV 03)
    - analyses of geochemical conditions in failed co-disposal waste packages for Three-Mile Island (TMI)
    - Adds last remaining representative fuels to 8 contained in REV 02
    - Final calculation by December 2002 $50k
  - TSPA-LA calculation for 11 fuel groups
    - Complete final portion of DOE SNF analyses from October to December 2002 $150k
    - Final calculation in FY2003 (December 2002)

Total=$200k

Design basis event and beyond design basis event analyses

FY2003 DBE & BDBE

- Perform surface facility design basis event criticality calculation
  - Feeds ISA for the proposed repository $60k
- Revise the N-Reactor inputs for the beyond design basis event calculations after GOTH results are in $20k
  - Revise ignition case to change release fractions
- Update DOE SNF source terms for the design basis event calculations $20k
  - Feeds ISA for the proposed repository
- Develop a curie-based canister release criteria for WASRD Revision 5 to replace current exposure-based criteria-Q calculation $45k

Total =$145k

System studies

- **FY2003**
  - Update *Integrated ICD Volume 1: U.S. DOE SNF and the MGR*, DOE/RW-0511 Rev. 02 $60k
    - include initial MGR design concepts for License Application
  - Finite-element structural analysis of MCO to determine structural capability to support a facility design able to meet licensing strategy $200k
  - Project management activities for Project Manager (P/T) $150k
    - Includes reviewing NSNFP waste form input reports, GOTH, and ASTM standards such as drying standard (but not pyrophoricity of uranium metal fuels)
    - monthly reporting, quarterly meetings, coordination of work packages, annual planning, computer support such as licenses, travel, management review of products

Total=$410k

FY2003 Summary

◆ FY2003 Criticality	$610k
◆ FY2003 TSPA	$200k
◆ FY2003 DBE & BDBE	$145k
◆ FY2003 Management	$410k
– Subtotal	$1,365k
– Fee	$ 68k
– Total FY2003 Funded Work	**$1,433k**

- (includes MCO analysis if not done in FY2002)
- (includes external consequence AMR for DOE fuels in not done in FY2002)
- Expect to include some work resulting from NRC technical exchange for DOE SNF before License Application

Disposal container criticality (cont.)

- **Post LA**
  - Separate analyses on rest of fuels to individually show they fall within the analyzed representative fuels
  - Analyses of fuels not bounded by the represented fuels

Status of FY2001 Work Item: *Integrated ICD Vol. 1: DOE SNF to MGR*

NSNFP / YMSCO Quarterly Meeting

David S. Rhodes
Manager, DOE SNF/Pu Special Projects
June 14, 2001

Status of Integrated ICD Volume 1

- ***Integrated Interface Control Document Volume 1: U.S. Department of Energy Spent Nuclear Fuel to the Monitored Geologic Repository*, DOE/RW-0511, Rev. 01A**
  - Controlled envelop dimensions for all DOE SNF canisters
  - Figures of canisters, waste package cavities, NSNFP and NR transportation concepts, and MGR facility entries and rack positions
  - Incorporating WASRD items eliminated during last review
    - DOE SNF single-element and multi-element canisters
    - Text revisions to support HLW canister inclusion (info only)

Status of Integrated ICD Volume 1

- ***Integrated Interface Control Document Volume 1: U.S. Department of Energy Spent Nuclear Fuel to the Monitored Geologic Repository*, DOE/RW-0511, Rev. 01A**
  - Provided to YMSCO for pre-review on June 4
  - YMSCO pre-review in progress in parallel with BSC checking which completed June 25
  - Formal DOE and contractor site review should start June 29
    - 3 week review period should end with comments due July 23
    - 5 weeks to incorporate comments and obtain concurrence by August 27
    - 2 weeks for final checking September 10
    - 2 weeks for approval and issue by September 29, 2001 (last work day of FY2001)